

Chapter 26

Geospatial Technology Curriculum Development

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ABSTRACT

The final project for students enrolled in Geospatial Technologies for the K-12 Classroom (GEOG 321) is the development of a lesson for their future classroom. An obstacle to implementing geospatial technologies in public classrooms is lack of relevant curriculum and data. After reviewing the limited existing curriculum, students design age-appropriate lessons for possible publication on the New Hampshire Geographic Alliance website. The objectives for this final project were: 1) students will determine age-appropriate skills that utilize geospatial technologies to support instruction in their intended discipline, 2) students will demonstrate the appropriate skills needed to design feasible lessons for the K-12 classroom, 3) students can integrate geospatial technology skills into a variety of disciplines and age levels, and 4) students can employ the geographic inquiry method in their lessons. Students presented their lessons to peers and outside reviewers to receive feedback. The students had the option to submit their lessons to the New Hampshire Geographic Alliance for pilot testing and dissemination to help fill the need for relevant curriculum and data.

INTRODUCTION

Implementing geospatial technologies in K-12 classrooms is unevenly distributed across disciplines, grade levels, and regions. An example of this is the fact that the technologies have been adopted more in science instead of geography classrooms (Kerski, 2003). Geospatial technologies include Geographic Information Systems (GIS), Global Positioning Systems (GPS) and remote sensing. There are many obstacles to implementing these technologies including lack of: administrative support, hardware, software, teacher training, time, curriculum, and easily accessible relevant data for the classroom (Bednarz, Downs & Vender, 2005).

Another possible reason for the low implementation rate may be the lack of standards. Standards for including geospatial technologies in the classroom have not been adequately included in either the national standards or many state standards (Milson & Roberts, 2008). In the National Geography Standards, the

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first standard expects students to know “how to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective” (Geography Education Standards Project, 1994). Since various technologies are not specifically mentioned, the interpretation of the standard is left to individual states and in some cases even districts. In the current national standards, GIS is considered a new technology and discussed in an appendix. The National Geography Standards are currently under revision and will recognize the increased importance of geospatial technologies across disciplines.

During an era of accountability and standards driven educational systems, the lack of standards affects the levels of administrative support, funding budgeted for hardware, software, and teacher training, as well as the development of curriculum, and data collection. By aligning the final project for students in the Geospatial Technologies for K-12 Classroom course with the needs of districts in the state, and providing opportunities for reviewing and piloting the lessons, the developed lessons and subsequent data sets can be made available to public school teachers through New Hampshire Geographic Alliance programs. With the anticipation of greater inclusion of geospatial technologies in the revised National Standards, there is a need for development of curriculum that is feasible with time and budget constraints, as well as easily accessible. While learning about the technology themselves, the students in this course are providing a service by developing lessons that meet this need.

PURPOSE STATEMENT

The Geospatial Technologies for the K-12 Classroom course serves both as a skills course for Geography majors and an elective for Education majors. (The college students in the course are referred to as pre-service educators in order to differentiate them from the students they will be teaching in the future.) It is considered an introductory course for GIS. Throughout the semester, the pre-service educators are exposed to a variety of lessons, programs and skills using geospatial technologies. After reviewing existing curriculum written for their discipline of study, the pre-service educators determine how geospatial technologies can be used to enhance student learning. The overarching goal of this project is for the pre-service educators to not only demonstrate mastery of basic GIS skills, but for them to apply those skills to a classroom setting. The pre-service educators are challenged to design lessons that support current subject curriculum, and enhance student learning through the use of technology. Lessons that meet these goals do not solely teach the students to use GIS, but also teach students content using GIS an important pedagogical concept when teaching GIS (Sui, 1995). Students will have the option of submitting their lessons to the New Hampshire Geographic Alliance for further review and possible online publication.

LEARNING OBJECTIVES

Through the process of developing a lesson, a pre-service educator will:

1. Determine age-appropriate skills and technologies that utilize geospatial technologies to support instruction in their intended discipline;
2. Demonstrate the appropriate technology skills needed to design feasible lessons for the K-12 classroom;

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